

# Xiurui Zhao (赵修瑞)

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## Research Interests

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**High Energy Process of Active Galactic Nuclei and Supermassive Black Holes**

## Appointments & Fellowships

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<b>University of Illinois Urbana-Champaign, Urbana, U.S.</b>	<b>2023-</b>
Post-Doctoral Research Fellow, advisor: Prof. Yue Shen	
<b>Center for Astrophysics   Harvard &amp; Smithsonian, Cambridge, U.S.</b>	<b>2021-2023</b>
Post-Doctoral Research Fellow, advisor: Dr. Francesca Civano, Dr. Martin Elvis	
<b>Center for Astrophysics   Harvard &amp; Smithsonian, Cambridge, U.S.</b>	<b>2020-2021</b>
Pre-Doctoral Fellow, advisor: Dr. Francesca Civano	

## Education

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<b>Clemson University, Clemson, U.S.</b>	<b>2016-2021</b>
Ph.D. in Astrophysics, advisor: Prof. Marco Ajello Dissertation: <i>Heavily Obscured Active Galactic Nuclei in NuSTAR Era</i>	
<b>Lanzhou University, Lanzhou, China</b>	<b>2012-2016</b>
B.Sc. in Physics, Cuiying Honors College	

## Honors and Awards

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Clemson University Outstanding Graduate Researcher Award (2 winners each year)	<b>2021</b>
Clemson Science College Outstanding Graduate in Discovery Award	<b>2021</b>
Clemson Physics Department Graduate Research Assistant Award	<b>2021</b>
SAO Predoctoral Fellowship	<b>2020-2021</b>
Clemson Graduate Student Travel Grant	<b>2019, 2021</b>
Cuiying Honors College Abroad Study Fellowship	<b>2014, 2015</b>

## Accepted Scientific Proposals as PI

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**16** accepted X-ray/optical/sub-mm proposals with **\$370k** grant as PI.

- **X-ray (1.6 Ms)**

- **NuSTAR Cycle 9 (Large, 500 ks NuSTAR + 142 ks XMM, \$130k)** **2023**  
“Systematically Constraining the AGN Coronal Properties with NuSTAR Using a Sample of Luminous, High-redshift Quasars”

- **NuSTAR** Cycle 8 (**Large**, 600 ks *NuSTAR* + 195 ks XMM, \$150k) **2022**  
*“Constraining the Properties of AGN Coronae using a Sample of Luminous, High-redshift Quasars with NuSTAR”*
- **NuSTAR** Cycle 8 (100 ks *NuSTAR* + 60 ks XMM, \$90k) **2021**  
*“Unveiling with NuSTAR the most powerful, heavily obscured, quasar ever discovered in X-rays”*
- **Swift**-XRT Cycle 19 (18 ks) **2022**  
*“Building with Swift/XRT a Sample of Luminous, High-redshift Quasars to Constrain the Properties of AGN Coronae”*
- **Swift**-XRT ToO (3 ks) **2021**  
*“Measure the X-ray flux of a rare coronal line event quasar exhibiting another optical flare”*
- **Optical (5.5 nights)**
- **MMT** 6.5m Hectospec (0.3+0.3 night, 335 sources) **2023A & 2022B**  
*“Complete the Hectospec Spectroscopic Survey of JWST NEP Time-Domain-Field”*
- **MMT** 6.5m Binospec (0.1+0.1+0.1 night) **2023A & 2022B & 2022A**  
*Monitoring a Coronal Line Event AGN*
- **MMT** 6.5m Binospec (0.4 night) **2023A**  
*Identify X-ray Bright Quasars and Constrain the AGN Coronal*
- **SAO FLWO** 1.5m FAST (0.2 night) **2023A**  
*Measure the Black Hole Mass of an X-ray Bright Quasar to Constrain Its Coronal Properties*
- **SAO FLWO** 1.2m Keplercam (1+1+2 night, g, r, i) **2023A & 2022B & 2022A**  
*“Monitoring the Continuous Optical Flares of a Coronal Line Event”*
- **Sub-mm (3 tracks)**
- **Submillimeter Array** (SMA) standard science observation (3 tracks) **2022B**  
*“Monitoring with SMA a Highly Variable Flat Spectrum Radio Quasar in the JWST North Ecliptic Pole Time-Domain Field”*

## Collaboration & Professional Service

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- Core Member of **HEX-P** Black Hole Growth & Corona Working Group **2022-**
- Member of *JWST* PEARLS Working Group **2022-**
- Member of **NuSTAR** Extragalactic Survey Team **2020-**
- Member of *Athena* Science Working Group **2020-**
- + Panelist for NASA **NuSTAR** Proposal Review **2022, 2023**
- + External reviewer for CFHT **2022A,B**
- + Reviewer for ApJ, A&A **2020-**
- Co-organizers of CfA High Energy Astrophysics Division Seminar **2021-2023**

## Invited Talks

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Caltech, Tea Talk	<b>May 2024</b>
Zhejiang University, Colloquium	<b>Sep 2023</b>
Peking University, KIAA-DoA Seminar	<b>Aug 2023</b>
Tsinghua University, Departmental Seminar	<b>Aug 2023</b>
UIUC, local group meeting	<b>May 2023</b>
Yale University, Galaxy Lunch Talk	<b>Apr 2023</b>
MIT, Brown Bag Lunch Talk	<b>Apr 2023</b>
NASA GSFC, X-ray Astrophysics Laboratory AGN Seminar (Virtual)	<b>Feb 2023</b>
CfA, High Energy Seminar	<b>Feb 2023</b>
Arizona State University, Cosmology Seminar	<b>Dec 2022</b>
University of Arizona, Steward Observatory/NOIRLab Galaxy group seminar	<b>Dec 2022</b>
MIT, High Energy Astro Group seminar (Virtual)	<b>Apr 2022</b>
Clemson University, Local Group seminar	<b>Apr 2022</b>
INAF OAS, Bologna, X-ray group seminar	<b>Sep 2019</b>

## Conferences & Contributed Talks

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High Energy Astrophysics Division 21th Meeting ( <i>Contributed Talk</i> )	Texas, <b>Apr 2024</b>
High Energy Astrophysics Division 20th Meeting ( <i>Contributed Talk</i> )	Waikōloa, <b>Mar 2023</b>
241st AAS Meeting ( <i>Contributed Talk</i> )	Seattle, <b>Jan 2023</b>
<i>NuSTAR</i> 2022 Conference ( <i>Contributed Talk</i> )	Italy, <b>June 2022</b>
New England Regional Quasar and AGN Meeting ( <i>Contributed Talk</i> )	Storrs, <b>May 2022</b>
High Energy Astrophysics Division 19th Meeting ( <i>Poster</i> )	Pittsburgh, <b>Mar 2022</b>
Black Hole Across Space and Time ( <i>Contributed Talk</i> )	Virtual, <b>Dec 2021</b>
238th AAS Meeting ( <i>Dissertation Talk</i> )	Virtual, <b>June 2021</b>
237th AAS Meeting ( <i>Contributed Talk</i> )	Virtual, <b>Jan 2021</b>
Supermassive Black Holes Meeting ( <i>Contributed Talk</i> )	Virtual, <b>Dec 2020</b>
235th AAS Meeting ( <i>Contributed Talk</i> )	Honolulu, <b>Jan 2020</b>
X-ray Astronomy 2019 Meeting ( <i>Poster</i> )	Bologna, Italy, <b>Sep 2019</b>
High Energy Astrophysics Division 17th Meeting ( <i>Poster</i> )	Monterey, <b>Mar 2019</b>
233rd AAS Meeting ( <i>Contributed Talk</i> )	Seattle, <b>Jan 2019</b>

## Mentoring & Assistant Experience

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Co-supervision of Clemson graduate student R. Silver	<b>2019-</b>
Co-supervision of Clemson graduate student A. Pizzetti	<b>2019-</b>
Co-supervision of Clemson undergraduate students D. Cole and Z. Hu	<b>2019</b>
Research Assistant, Clemson	<b>2018-2020</b>
Teaching Assistant (PHYS 2230), Clemson	<b>2016-2017</b>

## Workshops & Schools

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CSST summer school at Peking University	Beijing, China, <b>July 2023</b>
Summer School for Astrostatistics at Penn State	State College, <b>Jun 2023</b>
End-to-end Simulations with SIXTE Workshop	Virtual, <b>Mar 2022</b>
2022 Submillimeter Array Interferometry School	Virtual, <b>Jan 2022</b>
Winter School at University of Freiburg	Freiburg, Germany, <b>Feb 2015</b>
Summer School at University of California, Berkeley	Berkeley, <b>Jun-July 2014</b>

## Press Release

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Webb Glimpses Field of Extragalactic PEARLS, Studded With Galactic Diamonds **2022**

## Outreach & DEI

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- † Volunteer to teach astronomy and mathematics to elemental and high school students in the rural area of China **Qiajia, Summer, 2023**
- † Translate Sensing Dynamic Universe project into Chinese (help people with visual disability accessible to the dynamic Universe with sonified astromical light curves and spectra) **2022-2023**

## Publication List

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A total of **24** peer-reviewed papers, **3** submitted papers [ADS](#)

### - **First-author papers**

- 6) **X. Zhao**, F. Civano, C. N. A. Willmer et al., Accepted by ApJ  
*PEARLS: The NuSTAR and XMM-Newton extragalactic surveys of the JWST North Ecliptic pole Time-Domain Field II*
- 5) **X. Zhao**, F. Civano, F. M. Fornasini, et al. 2021, MNRAS, 508, 5176  
*The NuSTAR extragalactic surveys of the JWST North Ecliptic pole Time-Domain Field*
- 4) **X. Zhao**, S. Marchesi, M. Ajello, et al. 2021, A&A, 650, A57  
*The properties of the AGN torus as revealed from a set of unbiased NuSTAR observations*
- 3) **X. Zhao**, S. Marchesi, M. Ajello, et al. 2020, ApJ, 894, 71  
*A broadband X-ray study of a sample of AGNs with [OIII] measured inclinations*
- 2) **X. Zhao**, S. Marchesi, M. Ajello, 2019, ApJ, 871, 182  
*Compton-thick AGN in the NuSTAR Era. IV. A Deep NuSTAR and XMM-Newton View of the Candidate Compton-thick AGN in ESO 116-G018*
- 1) **X. Zhao**, S. Marchesi, M. Ajello, et al. 2019, ApJ, 870, 60  
*Compton-thick AGNs in the NuSTAR Era. II. A Deep NuSTAR and XMM-Newton View of the Candidate Compton-thick AGN in NGC 1358*

### - **Second/Third author or significantly contributed papers**

- 10) F. Civano, **X. Zhao**, P. Boorman, et al., Submitted to Front. Astron. Space Sci.  
*The High Energy X-ray Probe (HEX-P): X-ray population contributing to peak of the Cosmic X-ray background*
- 9) E. Kammoun, et al. (including **X. Zhao**), 2024, Front. Astron. Space Sci., 1308056  
*The High Energy X-ray Probe (HEX-P): Probing the physics of X-ray corona in active galactic nuclei*
- 8) N. Torres-Albà, M. Stefano, **X. Zhao**, et al., 2023, A&A, 678, A154  
*Hydrogen Column Density Variability in a sample of local Compton-thin AGN*
- 7) R. Silver, N. Torres-Albà, **X. Zhao**, et al., 2023, A&A, 675, A65  
*A New Mid-Infrared and X-ray Machine Learning Algorithm to Discover Compton-thick AGN*
- 6) R. Silver, N. Torres-Albà, **X. Zhao**, et al. 2022, ApJ, 940, 148  
*Compton-thick AGN in NuSTAR Era. IX: joint NuSTAR and XMM-Newton analysis of four local AGN*
- 5) S. Marchesi, **X. Zhao**, N. Torres-Albà, et al. 2022, ApJ, 935, 114  
*Compton-Thick AGN in the NuSTAR era VIII: A joint NuSTAR-XMM-Newton monitoring of the changing-look Compton-thick AGN NGC 1358*
- 4) R. Silver, N. Torres-Albà, **X. Zhao**, et al. 2022, ApJ, 932, 43  
*Chandra Follow-up Observations of Swift-BAT-selected AGNs II*
- 3) N. Torres-Albà, S. Marchesi, **X. Zhao**, et al. 2021, ApJ, 922, 252  
*Compton-thick AGN in NuSTAR Era VI: The Observed Compton-thick Fraction in the Local Universe*
- 2) S. Marchesi, M. Ajello, **X. Zhao**, et al. 2019, ApJ, 882, 162

*Compton-thick AGNs in the NuSTAR Era. V. Joint NuSTAR and XMM-Newton Spectral Analysis of Three “Soft-gamma” Candidate CT-AGNs in the Swift/BAT 100-month Catalog*

- 1) S. Marchesi, M. Ajello, **X. Zhao**, et al. 2019, ApJ, 872, 8  
*Compton-thick AGNs in the NuSTAR Era. III. A Systematic Study of the Torus Covering Factor*

- **Co-author papers**

- 11) R O'Brien, et al. (including **X. Zhao**), Submitted to AAS journals  
*TREASUREHUNT: Transients and Variability Discovered with HST in the JWST North Ecliptic Pole Time Domain Field*
- 9) N. S. Khatiya, et al. (including **X. Zhao**), Submitted to AAS journals  
*Characterizing the  $\gamma$ -ray Emission from FR0 Radio Galaxies*
- 10) P. Boorman, et al. (including **X. Zhao**), Accepted by Front. Astron. Space Sci.  
*The High Energy X-ray Probe (HEX-P): Probing the circum-nuclear environment in AGN down to extremely low luminosities*
- 8) I. Cox, et al. (including **X. Zhao**), 2023, ApJ, 958, 155  
*A simple method to predict  $N_H$  variability in active galactic nuclei*
- 7) S. P. Willner, et al. (including **X. Zhao**), 2023, ApJ, 958, 176  
*PEARLS: JWST counterparts of micro-Jy radio sources in the Time Domain field*
- 6) C. N. A. Willmer, et al. (including **X. Zhao**), 2023, ApJS, 269, 21  
*PEARLS: Near Infrared Photometry in the JWST North Ecliptic Pole Time Domain Field*
- 5) Q. Yang, et al. (including **X. Zhao**), 2023, ApJ, 953, 61  
*Probing the Origin of Changing-look Quasar Transitions with Chandra*
- 4) D. Sengupta, et al. (including **X. Zhao**), 2023, A&A, 676, A103  
*Compton-thick AGN in the NuSTAR Era IX: Analysis of seven local CT-AGN candidates*
- 3) R. A. Windhorst, et al. (including **X. Zhao**), 2023, AJ, 165, 13  
*Webb’s PEARLS: Prime Extragalactic Areas for Reionization and Lensing Science: Project Overview and First Results*
- 2) A. Pizzetti, et al. (including **X. Zhao**), 2022, ApJ, 936, 149  
*A multi-epoch X-ray study of the nearby Seyfert 2 galaxy NGC 7479: Linking column density variability to the torus geometry*
- 1) A. Traina, et al. (including **X. Zhao**), 2021, ApJ, 922, 159  
*Compton-Thick AGN in the NuSTAR era VII: a joint NuSTAR, Chandra and XMM-Newton analysis of two nearby, heavily obscured sources*